Table 4-1 Cleanup Estimate Option and Rationale

Cleanup Action	Rationale
Option 1 - Excavation of contaminated soil and monitoring well installation	Lowest cost option: removing contaminated soil and collection of additional data for future remediation decision making purposes.
Option 2 - Excavation of contaminated soil and installation of a pump and treat groundwater system	Mid-range cost option: collecting additional data, removing contaminated soil, and treating groundwater. This option immediately addresses upland contamination.
Option 3 - Dredging of shoreline sediments, installation of an upland barrier wall, and installation of an upland asphalt cap.	High range cost, the most comprehensive option: addresses removal of contaminated soils, sediments, and groundwater. This option also prevents residual contamination from migrating into the lowland sediments.

Table 4-2 Preliminary Cost Estimate for Cleanup Action

Remediation Options	Description	Estimated Cost
Option 1	**Excavation of hot spot contaminated soil and monitoring well installation**	
	Soil Excavation and Off-Site Disposal (hazardous waste) - assumes excavation of 2 upland hot spots (600 cubic yards total); offsite disposal at hazardous waste facility; backfilling; decontamination facilities; analytical testing	$183,466
	Monitoring Well Installation - Install 4 monitoring wells to 45' bgs (includes initial subsurface soil sampling/analysis, and one year of groundwater monitoring)	$102,582
	Subtotal	**$286,048**
	Contingency[a] (+15%)	$42,907
	2009 Inflation adjustment[b]	$10,029
	Total	**$338,984**
Option 2	**Excavation of hot spot contaminated soil and installation of a pump and treat groundwater system**	
	Soil Excavation and Off-Site Disposal (hazardous waste) - assumes excavation of 2 upland hot spots (600 cy total); offsite disposal at hazardous waste facility; backfilling; decontamination facilities; analytical testing	$183,466
	Monitoring Well Installation - assumes 4 monitoring wells to 45' bgs (includes sampling/analysis)	$42,587
	Groundwater Treatment - assumes 150' x 350' contamination plume; pump and treat with filtration and 2 carbon vessels (in series) w/ treated water discharge to POTW	$148,804
	Groundwater Treatment O&M and Monitoring- assumes 5 year operation and monitoring	$446,477
	Subtotal	**$821,334**
	Contingency[a] (+15%)	$123,200
	2009 Inflation adjustment[b]	$28,797
	Total	**$973,331**
Option 3	**Dredging of shoreline sediments, installation of an upland barrier wall, and installation of an upland asphalt cap.**	
	Soil Excavation and Off-Site Disposal (Haz) - assumes excavation of 2 upland hot spots (600 cy total); offsite disposal at haz facility; backfilling; decontamination facilities; analytical testing	$183,466
	Monitoring Well Installation - assumes 4 monitoring wells to 45' bgs (includes sampling/analysis)	$42,587
	Groundwater Treatment - assumes 150' x 350' contamination plume; pump and treat with filtration and 2 carbon vessels (in series) with treated water discharge to POTW	$148,804
	Groundwater Treatment O&M and Monitoring - assumes 5 year operation and monitoring	$446,477
	Barrier Wall - assumes soil bentonite barrier wall (i.e., slurry wall) around GW plume; dimensions: 1000' long x 60' deep with 12" protective gravel cover	$539,517
	Upland Cap - assumes cap dimensions 150' x 350'; HDPE geomembrane with drainage/protection layer overlain with 3" thick asphalt surface layer (includes gas vents and perimeter security fence)	$411,935
	Sediment Dredging - assumes nearshore sediment dredging using water-based equipment; includes bathymetric surveying (pre and post construction), sediment BMPs (e.g., booms, silt curtains, etc.), and sediment dewatering; dredge area 50' x 350' x 4' deep or approx. 2600 cubic yards	$453,126
	Sediment Disposal - assumes offsite transportation and disposal of dredged sediment (following dewatering/solidification) at non-haz facility; 2600 cubic yards	$193,737
	Subtotal	**$2,419,649**
	Contingency[a] (+15%)	$362,947
	2009 Inflation adjustment[b]	$84,836
	Total	**$2,867,432**

Notes:
1. Costs estimates developed using Remedial Action Cost Engineering and Requirements (RACER®), 2008, Software System for Windows
2. Estimates do not include additional study/investigation (e.g., RI/FS), design, long term monitoring, 5 year reviews, site closeout, etc.
3. Costs includes direct costs plus a location modifier of 1.021 (Washington State Average) and overhead and profit (25% field office overhead, 10% subcontractor profit, and 15% prime profit).

[a] The 15% contingency allows for unforeseen costs.

[b] Inflation mark up estimated using the RSMeans Historical Cost Index inflation mark up from 2008 to the first quarter of 2009